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ABSTRACT

Four case studies are presented to demonstrate the economic development potential of partnerships between community colleges and public and private sectors, focusing on programs that targeted a specific area of need in Oregon's economic base and raised significant funds for program implementation. Introductory comments provide background information and discuss the partnerships in terms of their benefits to the partners and to the public. The four case studies describe the public-private partnerships in detail, including discussions of the objectives, conception, funding strategy, and problems of each. The first case study is of the Fisherman Technology Program at Clatsop Community College, a marine and commercial fishing program designed to provide technical information and training in fish-finding systems and other technological advances to captains of United States fishing vessels. The Cascade Business Center Corporation is the subject of the second case study. The Corporation is a "business incubator" partnership at Portland Community College (PCC) formed to improve economic conditions in Northeast Portland by providing education, consultation, and professional support services to new and emerging small businesses, with preference given to minority- and women-owned businesses. The third case study describes the 2+2+2 Cooperative Honors Program in Electrical Engineering and Computer Engineering offered by PCC, the University of Portland, and Oregon Graduate Center to meet the needs of the high technology industry in metropolitan Portland. Finally, the fourth case study focuses on ED-NET, a statewide instructional television fixed service (ITFS) microwave system developed by 15 Oregon community colleges to bring specialized and custom-designed educational programs to underserved groups throughout the state. Additional materials include two articles from "Oregon Business," a list of participating Portland businesses, a course of study for 2+2+2, and maps showing the range of the ITFS microwave system. (LAL)

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PROFITABLE PARTNERSHIPS:

Public-Private Partners in Economic Development

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CASE Advancing Two-Year Institutions

Profitable Partnerships: Public-private Partners in Economic Development

Barbara Edge

December 10, 1986 2:45 p.m.

Introduction

- Background
- Benefits

Fisherman Technology Program

- Need
- Conception of the Project
- Public-private Partnership
- Funding Strategies
- Realization of the Project

Cascade Business Center Corporation

- Need
- Conception of the Incubator Project
- Project Goals
- Targeted Businesses
- Funding
- Incubator Board
- Transition to a Public-private Partnership
- Incubator Application Process
- Cascade Business Corporation Tenants
- Problems

2+2+2 Cooperative Honors Progam in Electrical Engineering and Computer Engineering

- Need
- Conception of the Project
- Funding Strategy
- Project Goals
- Recruitment
- Problems

ED-NET: Statewide ITFS Microwave System

- Background
- Need
- Benefits
- Goals
- Public-private Partnership
- Progress to Date

Forming public-private partnerships which target economic development has become an extremely effective mechanism for the community college to accomplish a major component of its mission. As the premier institution for meeting the personnel needs of business and industry and for meeting the needs of its clients for career education in initial training, upgrading, retraining, and training for second careers, the community college becomes a key player in the economic development of the region it serves.

The staff of a community college interact constantly with the major groups who share the responsibility for the economic well-being of the region. Linkages formed with business, industry, labor, professional associations, educational institutions, and city, county, state and federal agencies provide the pathways to target a critical need, form the partnerships, and develop the project or programs that will contribute significantly to meeting the need. Forming these partnerships which target economic development has become an important educational fundraising tool.

Public-private partnerships benefit both the partners and the public. The partners benefit through:

- **Increased clout.** Potential grantors take notice when educational institutions, public agencies, and private industry join forces to meet a need. The whole appears to be greater than the sum of its parts.

- **Increased access.** Each partner can use the singular linkages it has formed to the benefit of all.

- **Increased cost-effectiveness.** By reducing duplication through shared services, space, equipment, and resources, the targeted need is met at a far lower cost.

- **Shared responsibility.** Partners divide the responsibility for the development of the project/program and reduce the burden on any one partner.

- **Shared resources.** Each partner can contribute unique human, financial, and physical resources. A shared talent pool, shared project-development funds, shared plant and in-kind services greatly expand what can be accomplished.

- **Increased market.** Partners bring with them their own specialized clientele, an added insurance that the market will be there when the program gets off the ground. Partners participate and promote at the same time.

- **Increased media coverage.** Like grantors, the media sees more news in projects and programs authored, developed, and delivered by public-private partners.

- **Increased credibility.** Each partner benefits from the positive image gained by the partnership and the resultant effective program/project that supports the economy.

The public benefits through the effective partnerships because they accomplish the following:

- **Promote the economic base** that ultimately benefits all.
- **Provide educational opportunities** that would not exist because of limitations in funding and resources.
- **Focus on critical needs** of the community that the partners serve.
- **Save the taxpayer money** through maximizing resources and reducing duplication.

The four case studies which follow demonstrate the effectiveness of bringing together public institutions, private institutions, public agencies, private foundations, and private industry. They are similar in having formed partnerships, having targeted a specific area of need in the region's economic base, and having achieved the goal of raising significant funds for implementation. They differ in their partners, funding sources, duration of program, and success in accomplishing their goals. In these diverse models, Oregon community colleges act as the catalyst.

TRAWL TECH

The community college in Astoria has developed an innovative program to bring the latest in technology to Oregon's commercial fishing fleet.

By Barbara Edge

When Craig Cochran and Barry Fisher, both captains of fishing vessels in Newport, returned from the White Fish Authority Workshops in England, they knew that American commercial fishermen were in trouble — they were years behind the times in their methods. The abundant riches of the sea would be scooped up by European, Russian, and Japanese fishermen, whose modern methods of tracking and trawling left the majority of American fishermen unable to compete. But, thanks to the efforts of Cochran, Fisher and others who attended the British workshops, it is now possible in Oregon to acquire fish-finding systems and other technology advances.

For the past two years at the former Astoria Yacht Club in an unassuming wooden building, a wiry, articulate Briton has provided an astounding amount of technical information and training to 176 captains of American fishing vessels. Clatsop Community College's fisherman training program is a result of the efforts of a unique combination of business, industry, government and education. Dennis Lodge is the internationally recognized expert they sought and obtained to direct and teach the program.

Dave Phillips, the associate dean of instruction at the college, says of Clatsop's marine and commercial fishing program, "We had the basic program to initially train people, but we did not have the program to bring the experienced captains up-to-date in the state of the art. They had to go to Great Britain to get that training."

Briton essential

Due largely to Phillips' efforts, two years of tangling with the immigration authorities finally brought Lodge to Clatsop to direct one of the few programs

Photography by Dan Pitsch

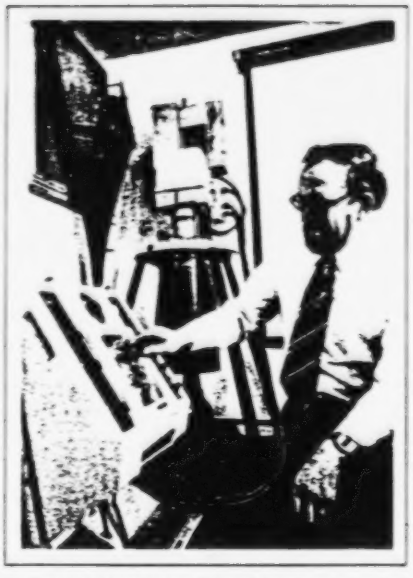
Dave Phillips, Associate Dean of Instruction, Clatsop Community College
Phillips is seen here with one of his program's chief teaching tools, the college's fishing boat, The Forerunner

-3-

6

in the world to teach fish-finding systems and fishing technology. The program is a result of the joint efforts of the college, Oregon State University's Sea Grant Program, the Oregon Otter Trawl Commission, and the Fisherman's Marketing Association, Inc. in Eureka, Calif. Lodge worked for the British White Fish Authority, a research and teaching organization in Hull, England, for 17 years, first as a sea-going engineer conducting trials of prototype equipment, and then as chief fisheries instructor during his last seven years there. Lodge's ability to impart his knowledge to his students resulted in the OSU Sea Grant Program and Phillips insisting that Lodge be the director or they would not offer it. Lodge's experience includes 10 years as an officer aboard naval vessels and freighters, and over 1,000 trips aboard fishing boats to advise fishermen on the use of their nets.

Said Lodge of commercial fishing today: "Because fish prices have dropped per pound over the past few years and fuel prices and other costs have risen sharply, they (commercial fishermen) must be more productive or they won't succeed. One way to be more productive is to use newer and more modern techniques for ground fishing and, particularly, mid-water fishing. That's the only way they've got to remain viable.



Dennis Lodge, international fishing expert
Lodge teaches Oregon commercial fishermen to use electronic fish finders like those shown

Experience not enough

Lodge explained that years ago men learned the fishing trade by working in a boat and talking to the men, to the captain. But with the massive input of electronic and hydraulic systems and the vast increase in boat prices, they can no longer rely on the old methods of training.

"They only way they can survive is to get into the new technology. As long as we have a fishing industry there will always be a requirement for technical training in it," said Lodge. "Men will need to go to classes to get the technical training. The craft is becoming less important and the technology more important. It's no good if you have the craft of mending web (net) and steering a boat if you can't put the boat in the right place. You have to know the biology of the fish. Which way are the fish migrating this time of year? What depth are they likely to be at? How much power shall I put down into the propeller at this time to save fuel? What electronics shall I use?"

Rare simulator donated

The electronic equipment now available for finding fish and monitoring the net have changed commercial fishing from an art to a science. Along one wall of Lodge's classroom is a wooden console housing an impressive array of this equipment. Many of the executives from the electronics companies which produce this equipment attended Lodge's classes in England. Because he knew them on a personal basis, in most instances a telephone call informing them of the program in Astoria was all it took to have thousands of dollars worth of equipment donated or loaned to the college.

"Probably this classroom and the one in Great Britain (White Fish Authority) are the two most advanced in the English-speaking world. Apart from a couple of schools in Spain, we are the only ones with a computerized simulator," Lodge said.

The simulator can program into the various devices any combination of conditions a fisherman may meet. "A captain can say to me 'I fish the Bering Sea at 38 fathoms; the seabed is sandy, and I normally fish pollock — what will it look like?' I can show him good or bad weather, a noisy engine, a quiet engine. With the push of a button I can draw up any situation you would like to envisage."

There are only two or three of these simulators in the world, Clatsop's being the only one in the United States. The $42,000 simulator was provided by the Sea Grant Organization, a branch of National Oceanic and Atmospheric Administration (NOAA); Sea Grant funded Dennis Lodge in the program as well.

The majority of the equipment de-

Community Colleges: A Resource for Business

For those business people who might have an idea for a vocational education program that could be set up by your local community college, listed below are the addresses and phone numbers of the community colleges around the state and the names of the people at the colleges who handle such programs.

Blue Mountain Community College
2410 NW Carden Avenue
Box 100
Pendleton, OR 97801
276-1260
Bob Kelly, Dean of Instruction

Central Oregon Community College
NW College Way
Bend, OR 97701
382-6112
John Weber, Dean of Instruction

Chemeketa Community College
4000 Lancaster Drive NE
PO Box 14007
Salem, OR 97309
399-5000
Nancy Borchgrevink, Dean of Instruction

Linn-Benton Community College
6500 SW Pacific Boulevard
Albany, OR 97321
928-2361
Barbara Dixon, Acting Dean of Instruction

Mt. Hood Community College
26000 SE Stark Street
Gresham, OR 97030
667-6422
Jack Miller, Dean of Instruction

Portland Community College
12000 SW 49th Avenue
Portland, OR 97219
244-6111
Paul Williams, Vice President Instructional Services

Clackamas Community College
19600 S. Molalla Avenue
Oregon City, OR 97045
657-8400
Ron Kaiser, Dean of Instruction

Clatsop Community College
16th and Jerome
Astoria, OR 97103
325-0910
Dave Phillips, Associate Dean of Instruction

Lane Community College
4000 E 30th Avenue
Eugene, OR 97405
747-4501
Jim Piercey, Vocational Dean

Southwestern Oregon Community College
Coos Bay, OR 97420
888-2525
John Rulifson, Dean of Instruction

Oregon Institute of Technology
Klamath Falls, OR 97601
882-6321
William P. Grimes, Dept. Chairperson

monstrated in the course was donated by two Japanese firms, Furuno U.S.A. Inc. and Epsco Marine; two American firms, Wesmar and Morrow Electronics; a West German Company, Krupp Atlas Elektronik; and a Norwegian company, Simrad. How to use this equipment to find fish and the theory behind it comprise the first of two workshops designed for fishing vessel captains and alternate captains.

Exemplary of the types of fish-finding equipment needed to make bottom trawling and mid-water trawling profitable today are the Wesmar color sonar and the EPSCO Chromoscope echo meter. The Wesmar color sonar looks horizontally around the boat up to about one-half mile away. The Chromoscope echo meter looks down vertically and detects fish swimming under the boat. Lodge explained that in the last five years fishermen have shown a greater interest in color TV technology for fish-finding. "Now different schools of fish can be color-coded to give a much better idea of school density and type of fish."

Guesswork no longer

Lyle Yeck of Newport had a full array of electronic equipment put on his vessel when he had it built. Yeck says that before Lodge's course he was not able to evaluate the data from the equipment readings with nearly the accuracy he can now. "Before, it was guesswork. Now my decisions are much more well-founded."

Phillips (L), and Patrick Killion
Killion, seen here in the wheelhouse, captains The Forerunner.

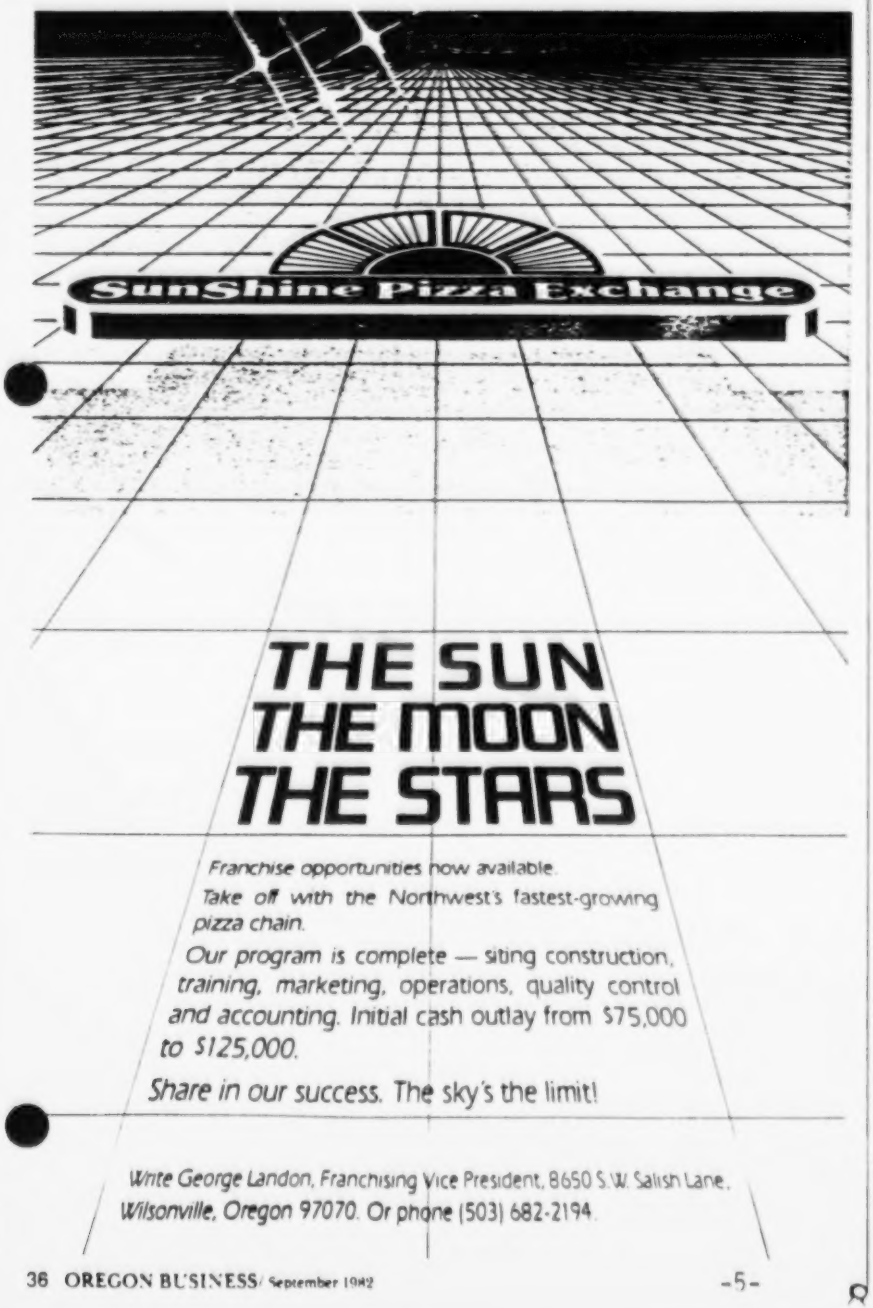
Yeck explained that the equipment doesn't really give a picture — a captain must be able to interpret what he sees. He feels that this workshop and Lodge's second workshop that his alternate skipper attended substantially speeded up the process of finding the fish and netting them. He also feels that 80 percent of the value of the course lies in Lodge's unique ability to impart an incredible amount of knowledge and experience and to apply it to almost any situation a skipper might come up against.

Included in this is his knowledge of a netsounder, which rides on top of the trawl net. Explained Lodge: "It transmits information from the net back to the ship. The captain can actually see the fish going into the net now, see how far the net is off the ground, and how far it is from the surface. He can see that the net's performing well; he can check out the rigging of the net and make sure it is satisfactory. So it takes a lot of the guesswork out of the job."

Lodge stated that these three pieces of equipment cost about $100,000, apart from the special winches and nets that are needed to convert a boat that has been bottom dragging to one that does mid-water trawling, Lodge's main area of expertise. Altogether it costs at least $250,000 to make the conversion.

Mid-water trawling is the most lucrative form of fishing done today, a direct result of the new technological advances in finding and netting fish. The catch rates are much higher at mid-water where there are numbers of schools which have never been tapped before. Lodge said that it is quite normal for a vessel to pull in 100,000 pounds of fish every hour when times are good.

Off Kodiak island in Alaska, for example, fishermen can pull in 100,000 pounds of pollock within four minutes, Lodge added. After hauling in the net, it is transferred almost immediately (floated across) to a Russian processing ship in a new, cooperative commercial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enterprise called joint-venture fishing.

According to Lodge, the fishermen making the most money are not the ones selling to American markets but those selling to South Korea, Japan, Russia, and West Germany. "It is possible for a guy to spend two or three months in Alaskan waters and return with profits approaching $200,000.

Due to the tendency of many mid-water fish such as pollock to begin to deteriorate very quickly, the fish must be processed almost immediately. American processing systems are not yet equipped to handle such fish. Joint-venture enterprises allow American fishermen to harvest fish which they otherwise could not sell. This fishing is allowing American captains to become familiar with all the techniques involved in mid-water trawling and thus be ready to branch out to new American markets as they develop. There are about 30 boats making good livings by joint-venture fishing, and almost all of them have learned the techniques with Lodge either in Great Britain or in Astoria. "That's encouraging," said Lodge. "We are managing to make an impact."

Donors benefit too

The fishing program is making an impact on more than the new breed of highly educated captains (Lodge reports that 10 percent of his captains have doctorates, 20 percent master's, and a large percentage of the remainder bachelor's degrees). All six companies which have donated equipment are regularly sending men from their design departments and service departments. In fact, they form 20 percent of Lodge's attendees. Not only do they learn from Lodge what the experiments at White Fish Authority have produced, but they hear first-hand what the men who use the equipment need.

In the second workshop, Lodge teaches what he learned at the White Fish Authority's unique flume tank about net designs, trawl doors (fin-like devices that open and close the net), and the cable tension measuring systems. Fish behavior, including their reaction to the fishing gear and fish preservation are also included in the program.

Lodge said that the only complaint he has about the workshops is the enormous quantity of information provided in so short a time. But, he added, the participants are also appreciative of the short sessions because a week's loss in fishing can cost a captain $5,000. "We have enough information to develop a two or three-year university course, but we cannot do that and accomodate the needs of commercial captains. They don't have the time."

He is gratified to find that many captains attend the workships a second time, bringing their sons and daughters with them.

Lodge explained that everything these captains have learned at the workshops hasn't necessarily come from him. They exchange information with each other "over a cup of coffee" in the classroom, which they would never do elsewhere.

Basics also taught

The workshops comprise the advanced courses of the marine and commercial fishing technology program at the college. Clatsop Community College is one of two two-year schools on the West Coast, outside Alaska, to offer an associate degree in commercial fishing, the only one in Oregon with an associate in marine technology and oceanography. The two-year, entry-level program is designed to teach the basics of trawling, shrimping, crabbing, and trolling for salmon.

Students learn seamanship, engine repair, marine electricity, electronics, hydraulics, marine business management, food preparation and storage, most of which is accomplished aboard the college's 50-foot boat, the Forerunner.

Pat Killion, the college's maritime ences coordinator, pointed out that some fishing students may attend for as little as three to four months. Imparting job skills is more important to the program than granting degrees, he said.

But of those who do attend Clatsop's complete program Lodge said, "We are certain that when a young guy spends two years at Clatsop, he is quite competent to take a boat out there tomorrow as a captain and succeed."

Barbara Edge is a Salem freelance writer who wrote this story for the state Department of Education.

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R. Michael Oxman
Project Manager

ShevlinCenter

(A project of Brooks Resources Corporation, developers of Black Butte Ranch)

The OREGON BUSINESS article "Trawl Tech" details the story of Clatsop Community College's fisherman training program, a project which significantly impacted the fishing industry of California, Oregon, and Washington. Details spared the business readership but important to educators and educational fundraisers include how the program was initiated and how the funding strategy was conceived and realized.

CONCEPTION OF THE PROJECT AND FUNDING STRATEGIES

It is important to note that at the time of this program's inception, the economy of the Oregon Coast from the mid-coast northward to the border was based on forestry products, fishing, and tourism, in that order.

Fishermen who had returned from England, where they had attended one of the few programs in the world to teach fish-finding systems and fishing technology, talked to marine extension agents about their experiences and the urgent needs of the fishing industry in Oregon and the Northwest.

It was the marine extension agents who came to the college with the expressed need. The college has had a highly-developed Commercial Fishing Program Since 1968, which does entry-level training through an associate degree program. It was funded in part through the Oregon State University (OSU) Sea Grant Program, a part of the National Ocean and Atmospheric Administration's efforts. The proposed program would target the captains of fishing vessels and update them to use electronic fishing devices that would enable them to compete with fishermen in the rest of the world.

Dave Phillips, Clatsop's associate dean of instructional services, degree programs, felt the Sea Grant Organization and OSU's Sea Grant Program were natural funding targets. But to sway this important potential grantor, he knew he would have to incorporate the support of both the state and private industry. He was successful in receiving it from a state commodity commission, the Otter Trawl Commission of Oregon, which represents shrimp and bottom fishery in the state, and the Fisherman's Marketing Association in Eureka, California, which represents trawl fishermen of shrimp, bottom, and mid-water fish.

With small contributions and a great deal of support from these two groups, the program did receive from the Sea Grant Program the necessary funding for salary, equipment, supplies, and travel. The fishing industry, in addition, sent the captains that made the program a success. As noted in the article, electronics firms donated the majority of the fish-finding equipment.

When Dennis Lodge had trained the majority of the captains in the region, the program closed and Lodge went on to repeat his unique contributions to the United States fishing industry in a program at the Southeast Alaska Technical College, where he has been for the past four years.

CASCADE BUSINESS CENTER CORPORATION

NEED

In Portland alone, over 80 percent of all operating businesses are considered small (employing 100 or less employees). Yet, starting a small business and being successful in small business is far from being the same. Dun and Bradstreet, Incorporated, reports an 82 percent failure rate for small businesses in the first ten years and a 34 percent failure rate in the first three years. Additionally, business bankruptcies in Oregon have increased 22 percent during the last five months. In spite of these dire statistics, small businesses continue to produce the greatest number of jobs. It is important, then, to focus on why small businesses fail and what can be done to reverse, or moderate, this trend in Portland. Studies indicate that small businesses fail for a variety of reasons. The most common include:

- Undercapitalization
- Prohibitive start-up costs
- Inadequate education and training to cope with:

  Human resources
  Market management
  Financial management
  Business plans
  Legal ramifications of contracts, bids, government regulation and/or tax structures
  Record keeping

To meet the critical needs, the Cascade Business Center Corporation provides a select combination of services that allows the new entrepreneurs time, space and educational training to become knowledgeable and succssful.

- **Education** encompasses such areas as capitalization, management, finances, record keeping, business law, business plans, marketing, pricing and personnel.
- **Access** to businss professionals for consultations, instructors for information, and laboratories for research and investigation is part of the support structure.
- **Below market-rate rents** create a professional environment at a cost that new businesses can afford during their developmental years.
- **Flexible operating space** enables a variety of businesses to start and expand within the incubator.
- **Professional support services** include secretarial, telephone, word processing, computer conference rooms, copying and bookkeeping services, all at or below market cost.

The Cascade Business Center Corporation is more than just another new project in an overwhelming wave of new educational/economic projects and ideas. It is a cornerstone and first step for the redevelopment of Northeast Portland and it is a continuation of a successful partnership of education and business in this community.

CONCEPTION OF THE INCUBATOR PROJECT

At an annual meeting of the Private Industry Council, what could be done to assist small business to succeed became the subject of considerable interaction. Representatives of the key partners in the yet-to-be-formed incubator generated the concept as a potential dynamic, positive contribution to an economically-depressed area of Portland. Thus, the forces were set in motion for the Portland Development Commission, the Private Industry Council and Portland Community College to become partners in the redevelopment of North/Northeast Portland.

In March, 1982, following the annual meeting, the Private Industry Council commissioned a feasibility study on the incubator project. The study performed by Northwest Strategies examined other incubator models nationwide, local conditions and need, financing options, possible local sites, and costs for the project. In terms of need, the study indicated that there was a significant level of activity in the number of small business contacts made in the metroplitan area. For example, the Small Business Administration received almost 4,000 requests for assistance in 1981. The City of Portland issued 414 business licenses in February of 1982, and between 1981 and February of 1982, IMPACT (a minority business development organization) was contacted by 75 minority-owned businesses and provided services to 58.

Generally, the report indicated that, while a number of business incubators had been developed across the country, some by private businesses and some by non-profit agencies, none had undertaken such a project as a means of educating and training small business entrepreneurs, assisting minority businesses, or furthering business development and job generation. The study concluded that:

- A small-business incubator was feasible and desirable in the inner North/Northeast Portland area.
- An incubator should offer a new, flexible educational system, low-market rents, essential office and professional support services.
- A combination of public and private funding should be sought to create the incubator, recognizing that traditional funding sources had decreased significantly.

THE PROJECT GOALS

The Cascade Business Center Corporation, a non-profit corporation, was conceived to:

- Increase the Opportunities for Success for New Small Businesses with Preference to Minority- and Women-Owned Businesses

  Business success is dependent upon adequate capitalization, strong management, financial planning, realistic business plans, accurate bookkeeping and an understanding of business laws . Each of these areas demands education, training or expertise to increase the chances for success. The small-business incubator supplies this training in a protected environment conducive to growth and development of the buinesses.

  In addition, minority- and women-owned businesses were targeted for inclusion in the incubator model. Although minority-owned businesses represent less than one percent of Portland's total number of businesses, 44 percent of the minority-owned businesses are located in the inner Northeast community. This sector of the business community presents a major resource for business development and expansion in the Northeast area.

  In the case of women in business, a report entitled THE BOTTOM LINE: UNEQUAL ENTERPRISE IN AMERICA by the President's Interagency Task Force on Women Business Owners, stated that of some 3,200 women respondents, most had started their own businesses in recent years and had been in the work force for several years prior to starting their own businesses. These women had created, not inherited, their own businesses, and had started their businesses alone, without partners or spouses. The most universal problems were in the area of financing, education, management training, technical assistance, sex-stereotyping and discrimination. The task force found that the problem of education in entrepreneurship lay in the inadequate preparation for business and in attitudes that limited career options and aspirations.

- Improve the Economic Conditions of the North/Northeast Neighborhood and the Metropolitan Area

  Small businesses contribute greatly to the economic stability of the community, instill a sense of pride, and promote a positive image. They provide the services demanded by the neighborhood and serve as the source of local employment. The tradition of a stable, yet active, commerical environment increases the area's attractiveness to regionally-based firms for the location of their corporate headquarters or plant expansion. Light industry, high tech, and new commercial businesses often spawn mutually-supportive retail trade which results in jobs and income.

- Create New Jobs for the North/Northeast Residents by Providing a First-Source Agreement for Hiring

  High unemployment has been a characteristic problem in inner Northeast Portland. The most recent figures indicate that unemployment in this area is twice as high as the city as a whole, placing the figure at 16.9 percent. For minorities, that figure jumps to 38.2 percent, and the estimate for inner Northeast youth (16-19 years old) is an astounding 82.5 percent. Between 1965 and 1977, the Albina industrial district, contiguous to Northeast Portland and the PCC Cascade campus, experienced a 46 percent decline in manufacturing employment. Typically, in older, close-in districts such as Albina, wholesale trade activities account for a growing percentage of employment as manufacturing firms leave the area. However, in the Albina area, wholesale trade employment actually dropped four percent in the same time period. Thus, most businesses capable of employing people in this economically-depressed area are leaving the area. By giving preference to neighborhood residents for training and employment, economic stability to the area will be increased.

  The City of Portland maintains a policy that private firms that benefit directly from public economic development investment agree to use the city's training and employment division as the first source of new employees. The city negotiates a first-source agreement with the firm. This includes a list of the entry-level jobs, the qualifications, hiring processes and timelines. Each agreement is tailored to fit the specific needs of the firm. To date, 650 low-income, unemployed residents of the city of Portland have been placed with the 25 firms currently operating with first-source agreements. These employers have found the program to be a source of prescreened, knowledgeable, job-ready persons, thus cutting down time and productivity losses normally occurring through a less selective process.

TARGETED BUSINESSES

Businesses that have been targeted for the incubator are those that can benefit from an educational/business environment, are non-retail in nature, exist currently in the area and need assistance, are new or emerging industries, are service oriented, are potentially viable, and have growth potential. Examples include building contractors, printing and publications manufacturers, light manufacturers, business and personal services (e.g., cleaning and maintenance, security, secretarial, bookkeeping and accounting), repair services (e.g., computer repair), high technology research, microelectronics processing, optical communications, solar business, film processing, robotics, specialized trade contracting, computer software, etc.

FUNDING

The funding of the Cascade Business Corporation project has been accomplished through a combination of sources. The Fund for the

Improvement of Postsecondary Education (FIPSE) contributed $208,006 for the first three years of incubator operation. Portland Community College will have contributed $1 million plus, over the three year period, both with in-kind contributions (e.g., the building, equipment, furniture, etc.) and operational dollars. The Oregon State Lottery dollars should amount to $75,000 if all the lottery funds accrue as projected. PCC borrowed $100,000 from the Portland Development Commission (PDC) to remodel Peninsula Hall, which houses the incubator, and is in the process of repaying that debt. The incubator is the only start-up enterprise the PDC has funded. The debt should be paid back totally by October 1, 1989. The Murdock Foundation granted $150,000 for the construction of a new building on campus for additional incubator space.

The incubator director and board were supposed to have developed a fundraising campaign plan to raise additional dollars to accomplish a transition out of the college's general fund. Because the board never gave the director the directive to pursue such an ambitious campaign, this was never accomplished. The ultimate transition of the incubator to a public/private partnership with a large corporation in the North/Northeast area was a viable option from the beginning. However, with the lack of an actualized development plan, the college was forced to speed up the transition. The college is in the final negotiation stages with Pacific Power to take over the operational aspects of the incubator. This leaves Portland Community College with the sole responsibility of providing the educational components for the tenants.

INCUBATOR BOARD

The incubator, as a non-profit corporation, was designed to have an active board to determine policies, such as those involving the admission of tenants, fundraising, future development, and expansion to the incubator facilities. From the very beginning, the incubator board was plagued with internal political problems, possibly because most of the board members had no real stake in the incubator. They were not people who had any vested interest or a clear understanding of how the small business community functions as a whole. As such, the board got mired down in political issues rather than operational issues that had to be dealt with on a day-to-day basis. In many instances the incubator project was slowed down or brought to a halt because the board could not give specific directions to the director or the college. During the last eight to ten months of operation, the incubator has been without an active board. In effect, the college took over the total responsibility for the operation and funding of the incubator.

This has created a considerable hardship for the college and, naturally, slowed the growth and progress of the incubator considerably. Only a small percentage of the board members have remained active and have been willing to give the college the type of leadership the incubaor needs. The main concern of many of the board members was the lack of liability insurance. Since the college was not willing to pay the insurance, many members of the board terminated their services. It is Portland Community College's strong recommendation that future incubators select board

members who have a very strong interest in the development of small business and who have a global commitment to the area of small business development to promote increased employment and bring new wealth into the community. The board needs to be kept small, no more than 10 or 12 members. These members should represent a cross section of the community: banking, economic development organizations, the mayor's office, the development commission, a representative or two from successful businesses in the area, a political representative, and a good representation from the educational community itself.

An obvious question that has to be resolved before any new board is put in place is that of liability insurance, since this appears to be a very large concern of any public board.

PROBLEMS

The problems listed here are in the order of importance as they relate to the PCC experience.

First and foremost is that of the selection of the board - a balanced board, one that is pro-active, one that will work together and work to deal with the problems. This is a major challenge when trying to launch any incubator successfully.

The second major problem is to attract a strong, effective director. To attract a person who will do the right job takes dollar resources that an incubator very often does not have.

Thirdly, fundraising is critical to the success of an incubator. It demands a board, a director and a college that is committed enough to put the necessary time and energy into the project to make it work. Grant-writing skills are needed and is a skill that most directors do not have. Therefore, it does put an extra burden on the college to dedicate personnel to write the grants for such a project.

Integrating the project into the campus life can be another problem. Most institutions have their own bureaucracies and look upon incubators as being something apart. Very often it is difficult to orient one's own staff to the value of such a project. The college staff, all the way from personnel to payroll, can doom a project like this, if they are not positively involved from the very beginning.

Further, it is critical to have community support, to involve all major facets of the community, so that they understand totally why the project has been selected for their community and what it will do. However, the project must be portrayed in realistic terms so that the community will not have unrealistic expectations. The community must understand that an incubator is a long-term project and will not produce an immediate turn-around in the economy. It may take five to ten years to see significant growth.

TRANSITION TO A PUBLIC/PRIVATE PARTNERSHIP

Finally, finding a corporate partner that will fully support such a project is a major concern. In Portland we have been very lucky in finding such a partner in Pacific Power. Serendipity brought the partnership about. While I was attending an incubator conference in Spokane, Washington, last year, I overheard corporate officers from Pacific Power discussing their plans to start up an incubator in the Northeast Portland area. I nonchalantly made the off-the-cuff comment that PCC might negotiate an agreement on its incubator if the right company was interested. The comment brought a lot of serious questions about our intentions to expand the operations. Two to three weeks after the conference, Pacific Power contacted the college about the possible merger.

Within a month, PCC and Pacific Power started the long process of working out the myriad of details that needs to be addressed in any complex merger like this. Today, a consultant is working out the final details of the action plan to allow the merger to take place by January of 1987. Even then, the fine tuning of the partnership will probably continue until late in the year.

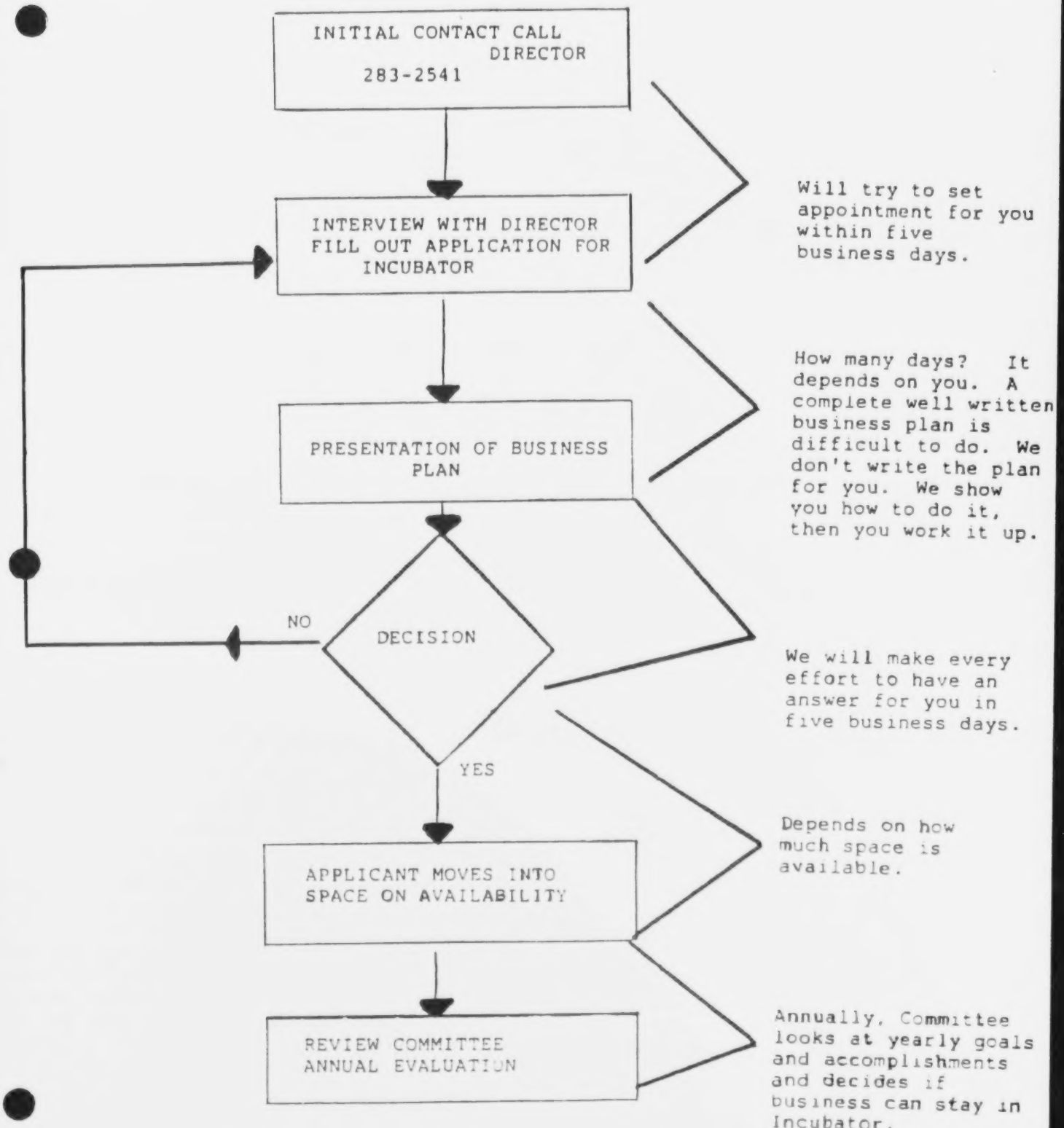
Pacific Power will remodel a 60,000 square foot building in the neighborhood and lease 25,000 square feet to 15 or 20 incubator tenants who will be primarily manufacturing in nature. This off-campus location will continue to provide rents at 20 percent below market rates. One of two large anchor tenants will provide financial stability to the project. One major anchor tenant has already been confirmed.

It is our intention to keep the eight campus resident tenants on board until they graduate or they can leave on their own accord. Naturally, any of the campus-based tenants can apply for space at the new, off-campus site.

This partnership has created excellent media coverage and boosted the public awareness of the project. This merger will also provide the project a great deal of political clout wherever and whenever it is needed. Certainly, the project will have a great deal more leverage in raising money for expansion or remodeling.

Finally, the partnership promotes credibility to our public whether in the financial, political or private community. This element is of particular importance as the future development of incubators in the state rests on the success of the one at Portland Community College.

INCUBATOR APPLICATION PROCESS


INITIAL CONTACT CALL
DIRECTOR
283-2541
INTERVIEW WITH DIRECTOR
FILL OUT APPLICATION FOR
INCUBATOR
PRESENTATION OF BUSINESS
PLAN
DECISION
NO
YES
APPLICANT MOVES INTO
SPACE ON AVAILABILITY
REVIEW COMMITTEE
ANNUAL EVALUATION
Will try to set appointment for you within five business days.
How many days? It depends on you. A complete well written business plan is difficult to do. We don't write the plan for you. We show you how to do it, then you work it up.
We will make every effort to have an answer for you in five business days.
Depends on how much space is available.
Annually, Committee looks at yearly goals and accomplishments and decides if business can stay in Incubator.

CASCADE BUSINESS CENTER CORPORATION TENANTS

NAME OF BUSINESS	YEAR ESTABLISHED	ETHNICITY	NO. OF EMPLOYEES	STATUS	NATURE OF BUSINESS
Ascot Domestic Service	1984	White/Female	4	Current Tenant	Home Maintenance
Executive Custom Tailoring	1984	Black/Male	1	Out of Business	Tailoring Serv.
Pax Pro Populo	1985	White/Female	2	Relocated	Consultant
PDX Services	1985	White/Male	4	Current Tenant	Delivery Service
Hill Marketing	1985	Black/Male	1	Moved/S. Carolina	Marketing
Ortek	1984	White/Male	4	Current Tenant	Manufacture/Sales of Programmable Control Device
Stewardship Maintenance	1984	Black/Male	20	Current Tenant	Building Maint.
Pandata, Inc.	1985	Black/Female	3	Current Tenant	Document Production, Word Processing, and Software Service
Rivera Construction	1984	Hispanic/Male	17	Current Tenant	Building Construction Contractor
Pitre & Sons	1984	Black/Male	1	Current Tenant	Painting and Light Construction
Magnum Protective Service	1985	Black/Male	6	Current Tenant	Private/Personal Property Security Company
Stewardship Promotions	1984	Black/Male	1	Current Tenant	Entertainment
N/NE Business Boosters	1986	Minority Business	1	Current Tenant	Business Organization

HATCHING SMALL BUSINESSES

Portland Community College hopes its proposed Small Business Development Center will be an "incubator" for small businesses. The concept could also spread to other community colleges.

By Barbara Edge

Small businesses represent 97 percent of all companies in the United States and produce about 40 percent of the nation's goods and service. They account for more than half the jobs in the private sector and have generated 87 percent of the new jobs in the last 10 years — 80 percent created by businesses with 100 or fewer employees. Yet, four out of five small businesses fail within the first five years. Obviously the health of our economy could be significantly helped by increasing the survival rate of this backbone of the nation's commerce.

Portland Community College's newly emerging Cascade Small Business Development Center could well provide a unique combination of space and services to help fledgling small businesses survive. Dubbed the "small business incubator," it will provide a nurturing environment for non-retail businesses. John Anthony, president of PCC, is envisioning light manufacturing, service companies, and beginning high tech industries "that usually start out in the garage." Persons who need help with a fledgling business and persons who wish to start a business will be accepted. Women and minority business people will be the number one priority, according to Anthony.

The incubator, which will be located on the Cascade campus of Portland Community College, is a joint effort of the college, Portland's Private Industry Council, the Portland Development Commission and local business people. The costs of the $3.7 million center will be shared by the college, local industry, private foundations, and the federal government. The Portland Development Commission is pursuing a $1.3 million grant from the federal Economic Development Administration. The college's in-kind share of approximately $1 million has already been committed. Of the $1 million being sought from industry and private foundations, $25,000 has already been contributed.

Two-thirds of the proposed 60,000 square foot facility will be used to house the businesses at rents below market level — about $2.50 a square foot. The upper level will house many of the college's extensive laboratories, currently located in temporary facilities throughout the campus. The laboratories will do double duty: they will continue to be used by the college's students in their training programs, and they will provide the young firms with capabilities and services usually available only to businesses with a well established cash flow. Businesses will pay pro-rated overhead costs (utilities, janitorial, and possibly secretarial and answering services) and regular fees for the college's programs. The center is scheduled to open in January of next year and will begin to take applications this fall.

James Van Dyke (l.) and John Anthony, president of PCC
PCC hopes its Small Business Development Center will eventually develop 15-18 new businesses every three years.

The college, through the services and programs it already has in place, will be offering the new businesses services and assistance similar to those provided by the highly successful Control Data Corporation of Minneapolis, which operates 150 small business centers throughout 36 states: management, marketing, data processing, computer services, word processing, accounting, legal assistance, import/export information, personnel management. A major part of the nurturing will be provided by advisors. There will be a cadre of business people available for assistance who will come from the 100 or more advisors already enlisted by the college, from the federal Small Business Administration and from banks and financial institutions. The college will seek additional advisors as needed.

The laboratories will provide the businesses with an impressive array of capabilities. The Microelectronic Process Technology Laboratory includes an electron microscope, high-resolution microscopes and a measuring microscope.

The Electronic Service Technology Laboratory specializes in communications devices — TVs, stereos, telephones — and has a complete set of test equipment. The Commercial Art Studio Laboratory offers a potential for graphic reproduction in terms of platemaking and air brush illustrations. There is a student design group in place which can take on the design and graphic needs of the businesses as well.

Although not to be located in the new building, the college's standard chemical and biological labs and its recording studio will be available. Since students in the cooperative work experience program will be placed in the incubator businesses and will use these labs in their college programs, the businesses will have a pool of trained employees to hire as needed both during the incubator period and when they relocate.

Once the facility is constructed, the program will be self-supporting. At an 80 percent occupancy, the center will generate a net profit of $90,000, which will go either into an expansion of the program or into assisting some of the businesses in capitalization when they leave.

Because businesses sign a first source agreement with the city for hiring and are to relocate in inner north and northeast Portland if successful after a three-year maximum stay in the incubator, ensuring the success of these businesses will also provide the jobs Portland needs. People from other areas in the state can enter the incubator, but they must relocate in Portland and hire from Portland's employment pool.

"If we can put out 15 to 18 new businesses every three years which hire 10 people in permanent jobs, we will make a significant impact on the economy," says Van Dyke. "I feel the incubator is one of the best proposals that has been made to improve economic conditions in northeast Portland."

Barbara Edge is a Salem freelance writer.

Incubator project nurtures fledgling entrepreneurs

By RICHARD COLBY
of The Oregonian staff

A building on Portland Community College's Cascade Campus has become a nest of free enterprise.

The Cascade Business Development Center, as the nest is called, is blessed with nine tenants. All are start-up businesses taking advantage of the college's small-business incubator program.

The project's acting director, Sam Brooks, said he expects at least two additions to the incubator's tenant list in the near future as more space becomes available on the campus.

The center's office shelter and business assistance, which can last up to three years per client, includes low-rent space, clerical help and plenty of instruction and advice about small-business operations.

To be chosen for the program, Brooks said, prospective entrepreneurs must appear before a committee of the center's board of directors that evaluates the entrepreneurs' potential for success.

Would-be restaurateurs and retailers cannot be accommodated because the center has no suitable frontage space for them, he said.

Among the criteria for selection is the applicant's willingness to continue the business in North and Northeast Portland after a three-year term at the center expires, Brooks said.

The nine participants thus far include a concrete contractor, a security company, a specialized instrumentation company about to start manufacturing, a custom tailoring business, a consulting team specializing in trauma and stress, a painting contractor, a computer programming service, a marketing and brokering consultant and a building maintenance enterprise.

The college organized the non-profit development corporation two years ago with local and federal funding to help out promising ventures, especially those started by minorities, women and North and Northeast Portlanders.

The incubation center at 573 N. Killingsworth St. was the outgrowth of efforts a few years ago to help would-be entrepreneurs gain critical business knowledge and avoid failure, said James Van Dyke, former dean in charge of the Cascade Campus.

Van Dyke now runs the college's Sylvania Campus but remains on the business center's board of directors.

He recalled that a local bank, working with the college, had offered a course for prospective small-business operators.

"It didn't work; it was too sophisticated," Van Dyke said he and others realized.

"We looked at the literature on incubators," he said, and the college also contracted with a local research firm, Northwest Strategies Inc., to find out what kind of operation would work.

The business center was incorporated with non-profit status in October 1982, and the community college began looking for outside funding to support it. That was a slow process, Van Dyke said.

The M.J. Murdock Charitable Trust provided $150,000 toward a nearly finished campus science building. In it is 3,500 square feet dedicated to the business start-up program, said Burdett "Bud" Emery, who in December succeeded Van Dyke as Cascade executive dean.

In October 1983, the U.S. Department of Education's Fund for the Improvement of Post-Secondary Education awarded the college a $230,900, three-year grant to start the program, Emery and Van Dyke recalled.

However, Emery said, some of that grant may be in jeopardy through 1985-86 federal budget cuts proposed by the Reagan administration.

A $100,000 loan in October from the Portland Development Commission helped pay for remodeling the campus' Peninsula Hall into offices for the starting businesses. The college provided more money for office space for the director and center counselor, Herman Houston.

Andy Delaney, named center director in July, said he quit the program in February partly because of the slowness of the Peninsula Hall remodeling.

Delaney said he felt the college administration, under both Van Dyke and Emery, had been too slow to react to the needs of the new businesses.

Brooks, who has continued running his business consulting company while heading the college center until a permanent director is chosen, said he had not encountered problems working with the campus administration.

Some of the principals in the nine businesses interviewed last week praised the help they have received.

Arnold Pitre, owner of Pitre and Sons Painting Contractors, said being in the center has enhanced his position with his bank.

A bank loan officer, who had turned down his loan application when he was on his own, has reacted more favorably toward lending him short-term operating capital, Pitre said.

Roy Rivera has been in a concrete-contracting business with partner Lou Parsons for a year. The advice that Rivera Construction Inc. has received, plus the $4.50-per-square foot rent it is charged, have helped the partnership move in areas he could not reach on his own, he said.

If he proposes a certain course of action to Brooks or Houston, Rivera said, "they won't say yes or no — they say, 'Look at this.'"

Some of the center tenants bring good advice with them, Brooks said. Ken Shepherd has 13 employees and clients like Greyhound Corp. for his Stewardship Maintenance Inc. building-maintenance business. He brought along a personal computer, which Brooks said he highly recommends for all start-ups.

2+2+2 EQUALS HOMEGROWN ENGINEERS FOR OREGON

By Barbara Edge

Taken from FUTURES, Spring/Summer 1986

PCC teams with University of Portland and Oregon Graduate Center to offer model program

"Having JoAnne working on the project was just like having another engineer on the team," said Laura Doyle, supervisor of PCC student intern JoAnne McBride. Doyle, manager of T.V. measurement systems engineering operations at Tektronix, Inc., credited McBride's excellent communications skills for her significant contribution to Tek's Communications Division project during her 1985 summer internship.

Perhaps such high praise for an electronics engineering intern could be expected, but McBride had completed only her first year of collegiate study in a new inter-institutional program - the 2+2+2 Cooperative Honors Program in Electrical Engineering and Computer Science and Engineering.

Success Stories

Laura Doyle is just one of a number of managers in Portland's high technology industries who have become advocates of the new program.

At a meeting earlier this year at Oregon Graduate Center, representatives of metropolitan Portland's high-technology industries heard success stories intended to stimulate their participation in the two-year old program. Companies participate as summer employers, advisors, and, ultimately, providers of scholarships or forgivable loans for these talented students.

Students spoke of the value of their summer on-the-job experiences, while the founders of the program conveyed the cost-effectiveness of firms investing in the program as a recruitment tool. But it was the students' supervising managers who stole the show with their praise of the interns' performance in challenging, and sometimes pioneering, tasks. Examples included PCC student Kerry Brady's research into the possible applications of artificial intelligence for Pacific Power and Howard Unkeles' development of software at Tektronix.

All of which brings smiles to the triage of educators who conceptualized and developed the program - Robert F. Dixon, chair of Portland Community College's Engineering and Technology Department, Dr. Lawrence E. Murr, director of the Office of Academic Affairs and Research at Oregon Graduate Center, and Dr. Thomas J. Nelson, dean of the Multnomah School of Engineering, University of Portland. Their express purpose was to keep Oregon's most talented in Oregon and to prepare them to be engineers with advanced degrees and research capabilties for metropolitan Portland's burgeoning high-tech industries.

Viewed as "the hottest high-tech growth area in the nation" by NEWSWEEK (February 25, 1985), Oregon needs to increase such personnel to live up to the statement made by venture capitalist Wayne B. Kingsley of InterVan that "Portland is where Silicon Valley was 15 years ago."

Targeting the Talented

Responding to evidence that Oregon's high school graduates leave the state for their higher education, Portland Community College, the University of Portland and Oregon Graduate Center joined together to develop the 2+2+2 Program. In this fully-articulated program, a student completes a two-year associate degree program at Portland Community College, takes upper-division courses at the University of Portland to receive a bachelor of science degree, and continues at the Oregon Graduate Center to pursue a master's degree.

Disturbing statistics from the Office of High School Relations of the State Board of Higher Education bear out claims that Oregon is losing its best and brightest to institutions in other states. During the period from 1976 to 1984, the percentage of students going out of state nearly doubled, from 11.4 percent to 20.4 percent. The actual number of persons leaving more than tripled: 1,006 in 1976 to 3,706 in 1984. The Office reports that the exodus is even more accelerated for the talented.

Incentives Offerred

"An important concern in structuring the 2+2+2 Program was the need to attract our most talented students and adults and to provide incentives for them to remain in Oregon," says Larry Murr, 2+2+2 project director. "In parallel with this concern was the need to make the program special to the extent that it could compete with the prestige programs in electrical engineering and computer science and engineering at major universities in other states."

Several aspects built into the program address both the attraction and retention of Oregon's most talented. Incentive to enter and remain in the program comes from scholarships, fellowships and summer employment in some of Portland's key high-technology industries.

Over $350,000 in grant money provided by Fred Meyer Charitable Trust, Tektronix Foundation, Rose Tucker Charitable Trust, the Portland Community College Foundation and Electro Scientific Industries has been coupled with over $75,000 in direct support of the students from the three participating educational institutions. Incorporation of the community college in the design contributes to the program's cost-effectiveness.

Scholarship support has been a critical element for people like McBride and Unkeles, who are typical of one of the population groups targeted by the program - the talented adult. The diverse experiences and no-nonsense attitudes of these adults help make them outstanding students and productive employees.

As expected, family commitments might preclude choosing a six-year education path, difficult at best when working part time, carrying a full credit load, and maintaining an honors-level grade point average. The availability of scholarships has been an incentive for students to commit to this especially rigorous program. With scholarship awards based on financial need as well as academic promise, the program has also assisted Portland's graduating seniors who have earned top grades in their class but have limited resources.

Beyond financial assistance, the program provides academic incentives. "Each of the three institutions is relatively small in its number of engineering faculty," says Tom Nelson. "By going to the three institutions, the students get exposed to a larger number of faculty, just as if they attended a larger institution."

In addition to the diverse faculty is an honors curriculum mutually developed by PCC, U of P, OGC and several local high tech companies - Intel, Tektronix and Electro Scientific Industries. The program has since been joined by other industry representatives whose involvement has produced both advisors and summer employment positions at Tektronix, Planar Systems, Floating Point Systems, Pacific Power and Light, and Inner Product Simulation. Other companies will come on board this summer. Employment not only helps the students financially but provides them with invaluable on-the-job experience to make them prime candidates for positions in industry.

Sophistcated Labs

Students beginning the articulated program at PCC are able to use the college's four well-equipped electronics laboratories. The labs have specialized equipment for linear, digital and microprocessor systems, including one lab of networked microcomputer development systems. PCC's new computer-aided drafting laboratory has 18 student work stations equipped with Tektronix state-of-the-art 417083 systems. Experience gained there will provide a basis for work in computer-aided engineering (CAE) at U of P's 22-station CAE lab, considered one of the most advanced student-oriented CAE labs in the country.

Armed with a solid background in applied research, students reaching the OGC portion of the 2+2+2 Program are then trained in advanced scientific research using the OGC's sophisticated computer center.

Oregon has much to gain from this program. With the American Electronics Association's projection of continuing growth in professional jobs in Oregon, the state must design its educational programs to increase graduates wth higher technical and research capabilities - and keep them in Oregon.

Besides adding to the pool of qualified engineers, the 2+2+2 Program is envisioned to be a powerful recruitment tool for the participating firms. Ties made between the student and the sponsoring firm will more than likely result in loyalty to remain at the company and in the state.

Howard Unkeles' experience is a case in point. Besides valuing "the real-world experience of working in an engineering environment" that is project-oriented instead of test-oriented, according to Unkeles, and that demands "the ability to manage one's own time, and seek information through personal interactions," he has gained a tremendous respect for Tektronix. He was surprised that "everyone (the engineers) was so willing to spend time with me and give me the information." Moreover, he was pleased with "how much Tek will allow me to do."

"I anticipated production-line work. Instead, they allowed and expected me to be creative," he said. When his 1985 summer internship was over, Unkeles remained with Tektronix two days a week to continue his work on developing new software.

Bob Dixon makes this analysis:

"Industries typically spend $10,000 to $20,000 to recruit an engineer with a master's degree. More frequently than not, the newly-employed engineers spend their first year of employment becoming familiar with the operation, needs and equipment of the specific facilities, often guided by the companies veteran staff. This initial year is essentially a training year, a year which costs industry at least $30,000 in salary, one-third to one-half that amount again in benefits, and the loss of services of their senior staff in their normal office duties. Far more cost effective would be the investment of an industry in the education of a top student."

The article that appeared in The Portland Community College Foundation publication FUTURES tells the 2+2+2 story as we like to present it to business and industry.

The untold story includes details of the region's need, how the program was conceived, the funding strategy, the recruitment of students and industrial participants, and the problems the program faces.

NEED

In July, 1982, Stanford Research Institute International completed a study for the Portland Chamber of Commerce, "Strengths and Weaknesses of the Portland Area as an Industrial Location."

The report states:

> Of the 34 inquiries received by the Portland Chamber of Commerce and considered by staff to be major expressions of interest in Portland, 26 (or 76 percent) were from firms or divisions of diversified corporations that manufactured high technology products...Currently the Portland area does not produce enough graduates with degrees in key skill areas to be competitive with many of the other metropolitan areas evaluated. The availability of recognized higher education facilities as a source of employees, consulting assistance, and research facilities is becoming increasingly important nationally as a plant location factor."

In April of the same year, C. Scott Gibson, then general manager of memory components operation for Intel, made a detailed presentation to the Joint Subcommittee on Electronics and High-Technology Industry of the Oregon Legislature. Among the disincentives that Intel found in Oregon was the shortage of trained engineers and scientists.

State Representative Vera Katz responded to these findings by sponsoring the formation of the Oregon Consortium for High Technology Education, a formal alliance uniting small and large firms in partnership with the state to encourage high quality engineering and science education in Oregon. One and a half million dollars was raised by industry since 1982 and matched by the state, which was distributed to Oregon Graduate Center (OGC), the University of Portland (U of P), the state universities, and the community colleges

CONCEPTION OF THE PROJECT

Leaders of the postsecondary educational community, including PCC's former president, John Anthony, OGC's Larry Murr and U of P's Tom Nelson, met to discuss current challenges. They concluded that the critical needs of the emerging high tech industry in metropolitan Portland had to be met by homegrown engineers. A half-jesting remark was made to offer a cooperative honors program in electrical and computer engineering. Subsequent meetings of the three turned the jest into a developed concept.

FUNDING STRATEGY

It was agreed that the three institutions would fund the development of the educational program. To attract Portland's most talented adults and high school graduates into the program, however, and to allow those with financial need to pursue the six-year program, the program designers wanted to obtain scholarship funding from outside sources. The development officers of OGC and U of P declined the challenge. As a part-time employee at PCC working in the Development Office while Director Vera Katz was on leave during the legislative session, I didn't think I had that choice. With no experience to know that scholarship support is so difficult to obtain, I used the guidelines from a one-day grantsmanship workshop and targeted both national and regional foundations and trusts. The strategy was to obtain scholarship funding from them for a four-year pilot program while placing students in the summer internships in industry. We would then impress the firms with the cost-effectiveness of the program as a recruitment tool, and finally obtain funding for scholarships or forgivable loans through the contribution of industry itself.

I am firmly convinced that we were successful in raising almost $400,000 in scholarship support to date because of my naivté. The development officers from the other two partners had withheld their condolences until after I had begun to submit the proposals! The timeliness in targeting a recognized need critical to the economic development of the region and the state; the assistance it would offer minorities, women, and the economically-disadvantaged to obtain an engineering degree; the public-private partnership; the credibility of each partner in the area of engineering education; and the inherent logic in the design of the program convinced local grantors, if not the national ones, to fund the project.

RECRUITMENT

Recruitment of students has not been a difficult task. With limitations in scholarship funds, the program has targeted small numbers, with special emphasis on encouraging minorities and women. At the start of the fall, 1985, semester/quarter, there were 34 students formally admitted in the program at PCC and U of P and one graduate student at OGC. This year there are again 35. Of the undergraduates, 11 are women, nine are Asians, one is Hispanic, and one is Native American. The two graduate students are women.

The talented adults come from the pool of highly-qualified students who come to PCC after a variety of life experiences. Many have rejected a baccalaureate program and are planning to enter a technician program because of the prohibitive costs of a four-year, no less six-year, course of study. The scholarships bring them into the program.

A "career day" for talented high school students is provided each fall. Students visit the three campuses, talk to students in the program, and

get a preview of the exciting possibilities afforded by the combined facilities and faculties. Once more, many students who can not afford a six-year program find the necessary financial assistance with 2+2+2.

Recruitment of participanting industries has been more difficult. Although 50 firms have been contacted and almost all expressed interest, only five are employing 2+2+2 summer interns. Of the 18 students who sought employment last summer, 10 were placed. All of these students and their industrial supervisors, however, were extremely positive about the internships. Four of the students were offered continuous employment during the school year, of whom two accepted.

PROBLEMS

The obvious problem confronting the program is the limited participation of high technology firms. The only hope for continuous scholarship support lies in industry, and without their participation in the internships, the hoped-for funding will be unfulfilled. Moreover, the amount of time necessary to make the one-on-one contacts with appropriate managers in each participating firm has been underestimated. While placement in internships was improved by the addition of PCC's co-op placement person to the 2+2+2 team, the task of attempting to obtain industrially-funded scholarships will remain with the three institutional program administrators, an overwhelmingly time-consuming task.

What will happen if the scholarships and/or forgivable loans are not forthcoming after the pilot program? We believe that there will always be a 2+2+2 progam as long as metropolitan Portland needs engineers. It is the type of student that we expect to see change. There will be fewer of those in financial need, and because of this, fewer women and minorities. How many total students the progam will continue to attract without the scholarship assistance is difficult to anticipate.

2+2+2 COOPERATIVE HONORS PROGRAM IN ELECTRICAL ENGINEERING AND COMPUTER SCIENCE AND ENGINEERING

SCHOLARSHIP SUPPORT FUNDS FROM FOUNDATIONS TRUSTS, AND CORPORATIONS

Source Institutions	Amt. & Fund. Period		Rec.
Rose Tucker Charitable Trust	$ 32,000	1984-88	PCC
Tektronix Foundation	33,758	1984-87	PCC
Fred Meyer Charitable Trust	32,980	1984-88	PCC
Fred Meyer Charitable Trust	229,126	1984-88	U of P
Fred Meyer Charitable Trust	50,630	1984-88	OGC
Electro Scientific Industries	1,000	1985-86	PCC
Oregon Community Foundation	5,000	1986-87	PCC
Portland Community College Found.	500	1985-86	PCC
TOTAL	$384,994		

PORTLAND COMMUNITY COLLEGE
Associate of Applied Science in Engineering

FIRST YEAR	1st Term	2nd Term	3rd Term
Engineering Orientation			
GE 101, 102, 103 (experience provided in both Fortran and Pascal)	3	3	3
Calculus w/Analytic Geometry			
MTH 200, 201, 202	4	4	4
Chemistry			
CH 201, 202, 203	4	4	4
Graphics, GE 115	3		
Communications			
WR 121, 122		3	3
Social Science (6 cr)			
History (3 cr)	3	3	3
	17	17	17

SECOND YEAR			
Calculus w/Analytic Geometry			
MTH 203	4		
Applied Differential Equations			
MTH 221		4	
Physics			
PH 221/4, 222/5, 223/6	5	5	5
Digital Systems			
GE 204, 205, 206	4	4	4
Electrical Circuit Analysis			
GE 221, 222, 225	4	4	4
Materials Science			
GE 231			4
	17	17	17

UNIVERSITY OF PORTLAND
Electrical Engineering

THIRD YEAR

Fall Semester		
MTH 322	Applied Math II	3
EGR 213	Statics & Strength of Materials	3
EGR 351	Engineering Economy	3
EE 351	Electronics Fundamentals	3
ME 331	Fundamental Thermodynamics	3
PHL 350	Philosophical Inquiry	3
		18

Spring Semester		
EGR 103	Intro. to CAD	3
EGR 212	Engineering Mechanics: Dynamics	3
EE 301	Electromagnetic Fields	3
EE 333	Microprocessors	3
EE 352	Electronic Circuits	3
EE 371	Electronics Lab	1
PHY 331	Intro. to Modern Physics	3
		19

FOURTH YEAR

Fall Semester		
MTH 461	Applied Statistics	3
EGR 400	Engineering Seminar	1
EE 320	Energy Conversion	3
EE 480	Senior Design Project Prep	1
Technical Elective		3
PHL 466	Engineering Ethics	3
THE 350	Theology Inquiry	3
		17

Spring Semester		
EE 470	Energy Conversion Lab	1
EE 481	Senior Electrical Design Project	3
Technical Electives		6*
FA 207	Fine Arts	3
Theology Elective		3
		16

*May be taken at OGC

UNIVERSITY OF PORTLAND
Computer Engineering

THIRD YEAR

Fall Semester		
MTH 322	Applied Math II	3
EGR 213	Statics & Strength of Materials	3
EGR 351	Engineering Economy	3
EE 351	Electronics Fundamentals	3
EE 435	Data Structures	3
PHL 350	Philosophical Inquiry	3
		18

Spring Semester		
EGR 103	Intro. to CAD	3
EGR 212	Engineering Mechanics: Dynamics	3
EE 301	Electromagnetic Fields	3
EE 333	Microprocessors	3
EE 352	Electronic Circuits	3
EE 371	Electronics Lab	1
PHY 331	Intro. to Modern Physics	3
		19

FOURTH YEAR

Fall Semester		
MTH 351	Numerical Methods in Computing	3
MTH 461	Applied Statistics	3
EE 434	Microprocessor Applications	3
EE 472	Microprocessor Lab	1
EE 480	Senior Design Project Prep	1
PHL 466	Engineering Ethics	3
THE 350	Theology Inquiry	3
		17

Spring Semester		
EE 400	Engineering Seminar	1
EE 482	Senior Computer Design Project	3
Technical Electives		6*
FA 207	Fine Arts	3
Theology Elective		3
		16

*May be taken at OGC

OREGON GRADUATE CENTER
Electrical Engineering

The M.S.E.E. program requires 48 course credits + thesis. The core courses designated * are required.

AP/EE	501	Mathematical Methods I
AP/EE	502	Mathematical Methods II
AP/EE	503	Mathematical Methods III
* AP/EE	508	Classical Electromagnetism I
* AP/EE	509	Classical Electromagnetism II
* AP/EE	515	Introduction to Solid State
AP/EE	516	Semiconductor Physics & Electronics I
AP/EE	517	Semiconductor Physics & Electronics II
EE	518	Semiconductor Devices for Silicon ICs
EE	519	Advanced MOS Devices
* AP/EE	525	Random Variables, Processes & Communications
AP/EE	530	Applied Optics
AP/EE	540	Quantum Electronics I
AP/EE	541	Quantum Electronics II
AP/EE	542	Quantum Electronics III
AP/EE	545	Electron Optics
AP/EE	500	Special Optics
* EE	590	Linear Systems
* EE	591	Digital Systems
AP/EE	600	Research
AP/EE	700	MS Thesis

Course Work
12 Credits of Advanced Mathematics
8 - 12 Credits in a Minor (Physics or Computer Science)
16 - 20 Credits Core Courses
9 - 16 Credits Specialty Courses

The following specialty areas exist:
Solid State Devices
Solid State Materials Processing
Solid State Materials Preparation and Characterization
Laser and Electrooptic Systems
Electron and Ion Optical Systems
Communications
Optical Information Processing
Instrumentation
Digital Systems

OREGON GRADUATE CENTER
Computer Science and Engineering

FIFTH YEAR

Fall

CS 510	Software Tools or
CS 503	Programming Language Design
CS 514	Database Systems or
CS 522	VLSI Systems
CS 521	Computer Architecture
CS 531	Discrete Mathematical Structures

Winter

CS 500	Software Engineering or
CS 502	Programming with Functions
CS 523	Multiprocess and Multicomputer Architectures or
CS 505	Relational Database Theory
CS 511	Principles of Compiler Design
CS 534	Algebraic Structures in Computing

Spring

CS 524	Dataflow Architectures or
CS 525	Database Computers
CS 530	Mathematical Logic or
CS 532	Analysis and Design of Algorithms
CS 512	Compiler Design Laboratory
CS 513	Operating Systems Principles

SIXTH YEAR
THESIS RESEARCH AND COLLOQUIA

ED-NET: STATEWIDE ITFS MICROWAVE SYSTEM

BACKGROUND

Education is an indispensible part of the infrastructure which insures the economic stability and promotes the economic development of a state. The availability of and access to specialized education is of paramount importance to the community, the state, and even the nation.

Delivery of educational services and information via telecommunications is recognized as an important breakthrough in access and availability and is sought world-wide. Microwave systems form an important link in a telecommunications network, the link that provides both point-to-point communications with interactive capabilities and the ability to transmit many programs simultaneously. While cable television allows an educational institution to broadcast a limited number of programs of wide interest and demand to people's homes, a microwave system allows an institution to focus its delivery of individualized programs to specific targeted clients -- other campuses and outreach centers, industries, agencies, and other educational institutions. As educational institutions connect electronically, the interties will allow local origination of a course to be delivered to any or all of the other sites. Such a capability will expand course/program offerings to a tremendously increased client group while lowering the cost.

NEED

Despite the use of telecourses via cable and teleconferencing at specific sites as alternative delivery systems, there remains a large underserved population.

Educational opportunities are not equally available to all Oregon citizens. Instructional expertise is often available in larger metropolitan areas, such as Portland, Salem, and Eugene, but simply either not available or too costly to bring to smaller communities. Conversely, some instructional specialists available in small communities are often not available in larger ones. In either case, many citizens who wish to update skills, obtain or continue certification, or obtain college degrees must spend large sums of money to obtain specific educational offerings or simply lose out entirely.

A state-wide Instructional Television Fixed Service (ITFS) microwave system would bring to the citizens of Oregon more equitable educational opportunitis and opportunities for spcialized, custom-designed programs. Among the underserved groups are:

- Businesses and industries with employee training needs.
- Students at campuses where there is insufficient enrollment for their desired course.

- Employees whose shifts or 12-hour, flexi-scheduled work days preclude enrollment in regularly-scheduled courses.
- Inmates of city and county jails.
- Professional staff of colleges and public school districts.
- Students in public school districts.
- Employees at local hospitals, fire stations, and police training facilities.

BENEFITS

A statewide ITFS microwave system would provide the following benefits:

- Allow point-to-point delivery of specialized programs with two-way audio capabilities for industry, public agencies, etc.
- Allow for more highly-developed and specialized educational programs from pooled resources, (e.g., Japanese).
- Bring any program to any other point in the network.
- Avoid unnecessary duplication of programs.
- Preserve programs otherwise dropped because of low enrollment.
- Promote continuing education by providing on-site educational services statewide in a myriad of occupations.

PUBLIC-PRIVATE PARTNERSHIP

In 1984, the fifteen Oregon community colleges attempted to secure lottery funds to develop a statewide telecommunications network for more equitable delivery of educational services to the citizens they served. Oregon community colleges had by this time amply demonstrated its abilities to deliver by this method. Telecourse enrollments had reached over 10,000 per three-term year; however, the public broadcast station was simply too costly to utilize for live programming and was limited in hours. Accessibility to specialists and continuing education programs was limited to larger schools. A more equitable distribtuion of programming could occur if a community college network were in place.

Simultaneously, the four-year colleges and universities had also applied for funds from a private grant source to build a telecommunications network for their use for delivery of servics to high tech industry for engineering, computer science, and other graduate-level programs.

Ironically, and perhaps as luck would have it, neither was funded that year. In 1985, the community colleges and higher education were again

going to seek funding for their individual requests, this time both from the legislature. The community college's representative in this venture was Ray Pirkl of Portland Community College. Pirkl arranged a meeting with the chair of the local American Electronics Association Chapter, Dr. Angel Pilato, to ask for support of a separate but related Portland Community College request. The college was seeking funding for an ITFS microwave system for delivery of educational services in metropolitan Portland. It was revealed at this meeting that the community colleges and higher education were seeking legislative funds independently to build a state with telecommunications network. (If by now you have gotten the feeling that the community colleges and four-year colleges and universities were not communicating on this issue, you are correct. In fact, competition at this point was severe.)

Pilato was at this time head of Corporate Education for Tektronix, the largest employer in Oregon. She immediately questioned the wisdom of both groups applying for funds independently. In November, 1985, she called a meeting between Pirkl and Roger Olson of the Oregon Center for Advanced Technology Education (OCATE), which represented five institutions of higher education.

In a very frank meeting with both groups, Pilato made it clear that if community colleges and higher education continued on their independent courses of action, the AEA and much of business and industry would lobby against both requests. It was also made abundantly clear that it would be a joint effort of community colleges, higher ecucation, and business and industry that would be successful in obtaining the necessary funding.

This, then, was an unusal scenario in which industry took the lead in developing a partnership rather than education.

A task force was pulled together in February, 1986, with three representatives from community colleges, three from higher education, three from industry, and one from private higher education. This task force met to break down the community college-higher education resistance to cooperation and to develop a strategy to get a state delivery system built. Each group contributed $3,000, for a total of $9,000, to have an engineer do a feasibility and cost study. The proposed system layout included several two-way video channels and several one-way video channels with two-way audio. (See attachment A.)

Before the feasibility study was complete, it became apparent that a fourth group needed to be represented on the committee. The 1984 legislature had designated that OPB would coordinate all educational television in the state. It was also made clear by the engineering consultant that the cost of the proposed microwave network could be reduced by 70 percent if it were placed on existing OPB towers that blanketed the state. (See attachment B.) Oregon Public Broadcast (OPB) was added as a partner. By this time, the other three principal members had wholeheartedly agreed to cooperate and to approach the legislature for funding.

Now the problem became one of convincing the OPB Commission to put the cost of the system, $7.85 million, in their budget since the mandate called for them to coordinate all such services. To say they were a little surprised is an understatement. Their concern was that this extra request might jeopordize their regular budget requests for operation of the OPB system and their special request for a new building to house their operations.

Several more meetings were held in March, April, and May of 1986. The position of the group was strengthened. It was agreed at this time that, to maintain a neutrality among the educators, Pilato would continue to head the task force, which had now become a steering committee.

The engineering study was completed by late April, 1986, which indicated that the network could be built.

A set of visuals was prepared for presentation of the network, called ED-NET, to anyone who would listen. Pilato and Pirkl made the first of many to the Oregon Business Council (OBC), an organization of top CEOs and presidents of 50 major Oregon companies. These represented not only a wide diversity of industry, including banking, electronics, and general manufacturing, but also farming, agriculture, forestry, etc. They also represented industry from every corner of the state. They overwhelmingly endorsed the concept, and through their education sub-committee, helped us with future presentations.

PROGRESS TO DATE

Within three months several important things happened:

- We had firm, written endorsements for the network from 12 highly-influential groups, including Oregon Associated Industries (OAI), the Oregon State Educational Coordinating Committee (ECC), the two state boards of education, the OPB Commission, and the State development commission, among others.

- The Oregon Business Council hired Pilato to work full time on steering this project and to provide offices and support staff.

- Lobbyists were convinced, from a number of groups, to support the network during the 1985-86 legislative session.

- Many sub-committees among education and industry began meeting to discuss operational strategy, including governance of the network, programming, and commitments from education to deliver services.

- Meetings have been set up in 15 community college locations for college presidents, board members, local legislators, and key community leaders. These meetings will be completed prior to the beginning of the 1987 legislative session.

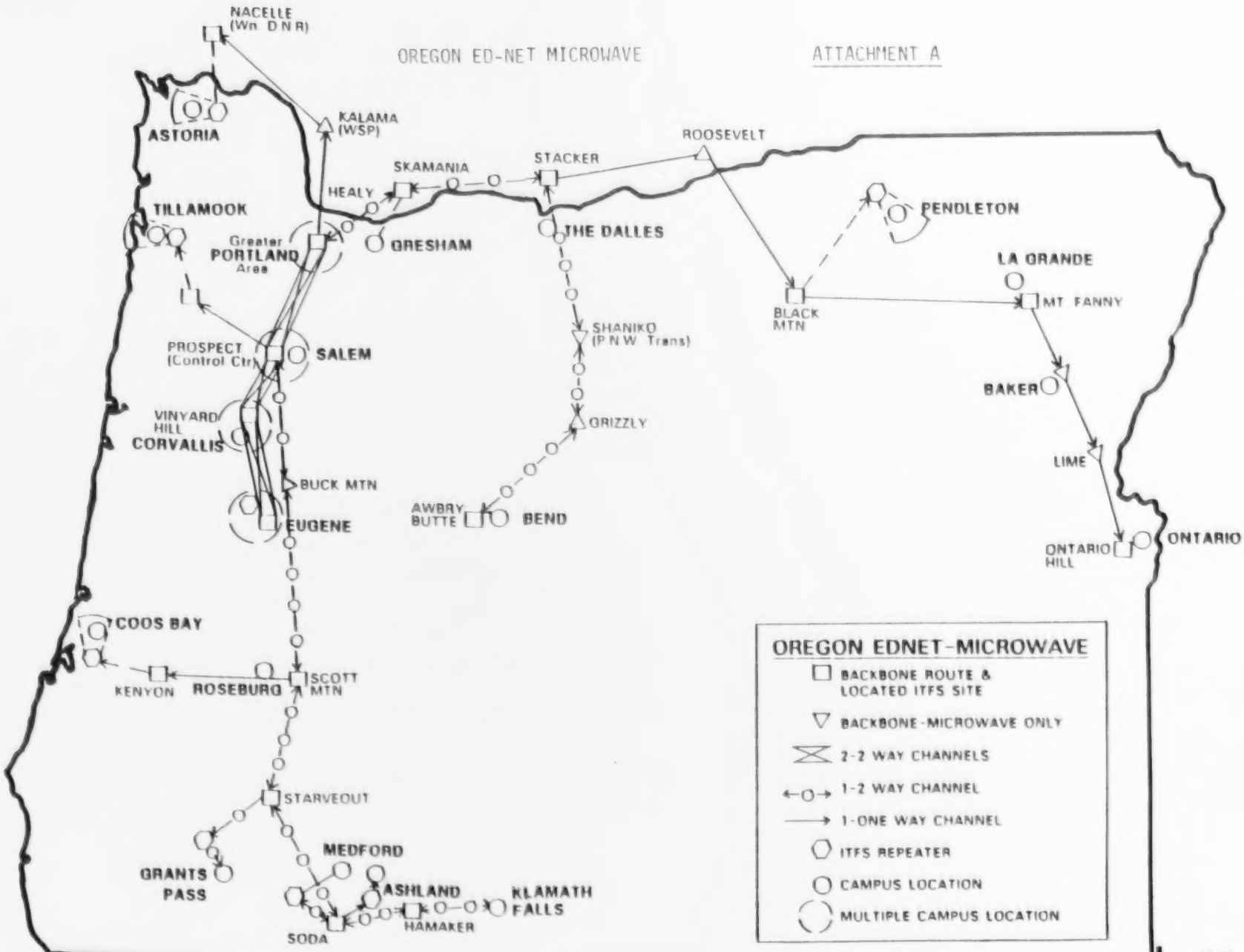
- Each community college and four-year school has determined its costs for getting on the network and receiving programming from it and is budgeting for this equipment.

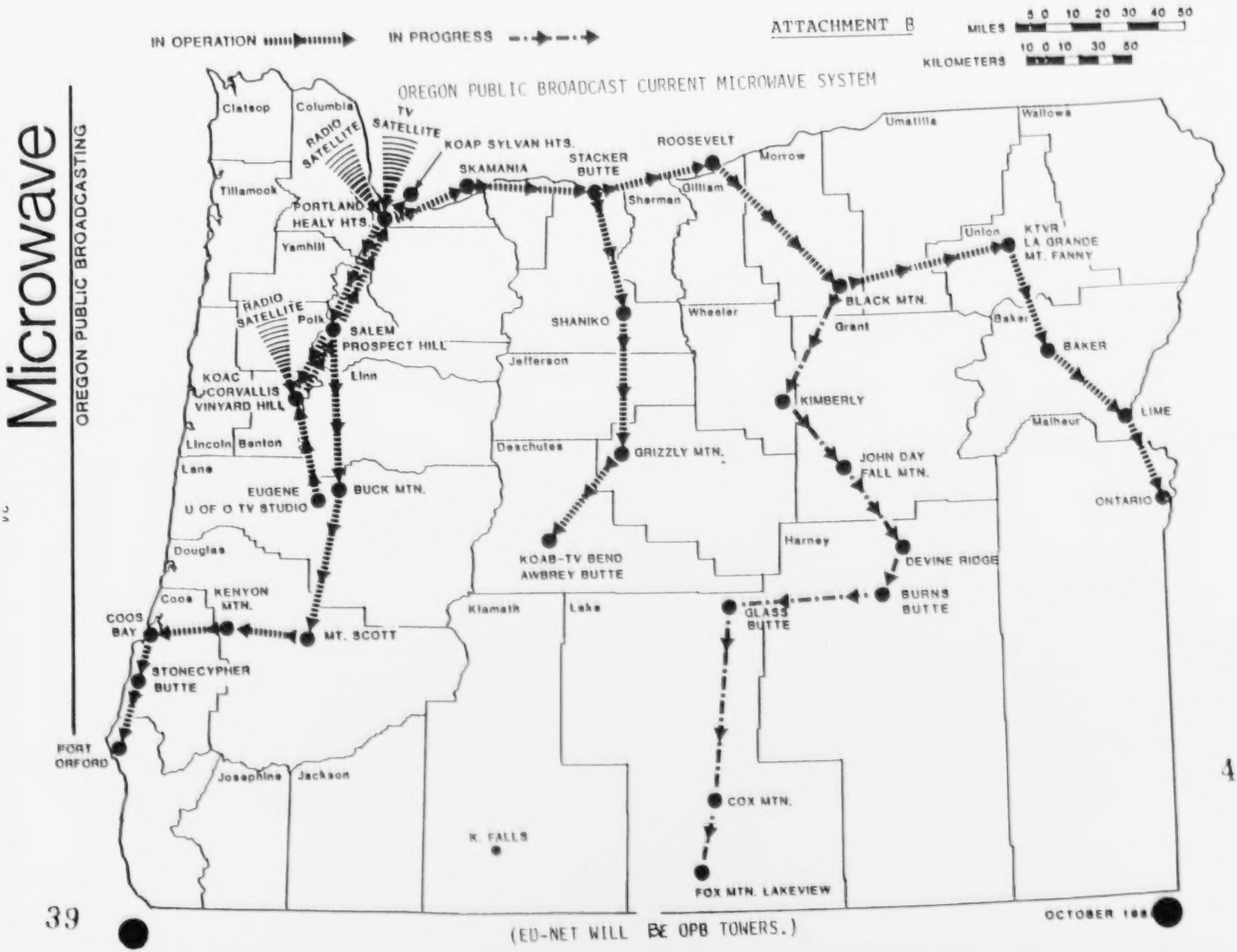
- Industry has committed to use the network to deliver updating services to instructors.

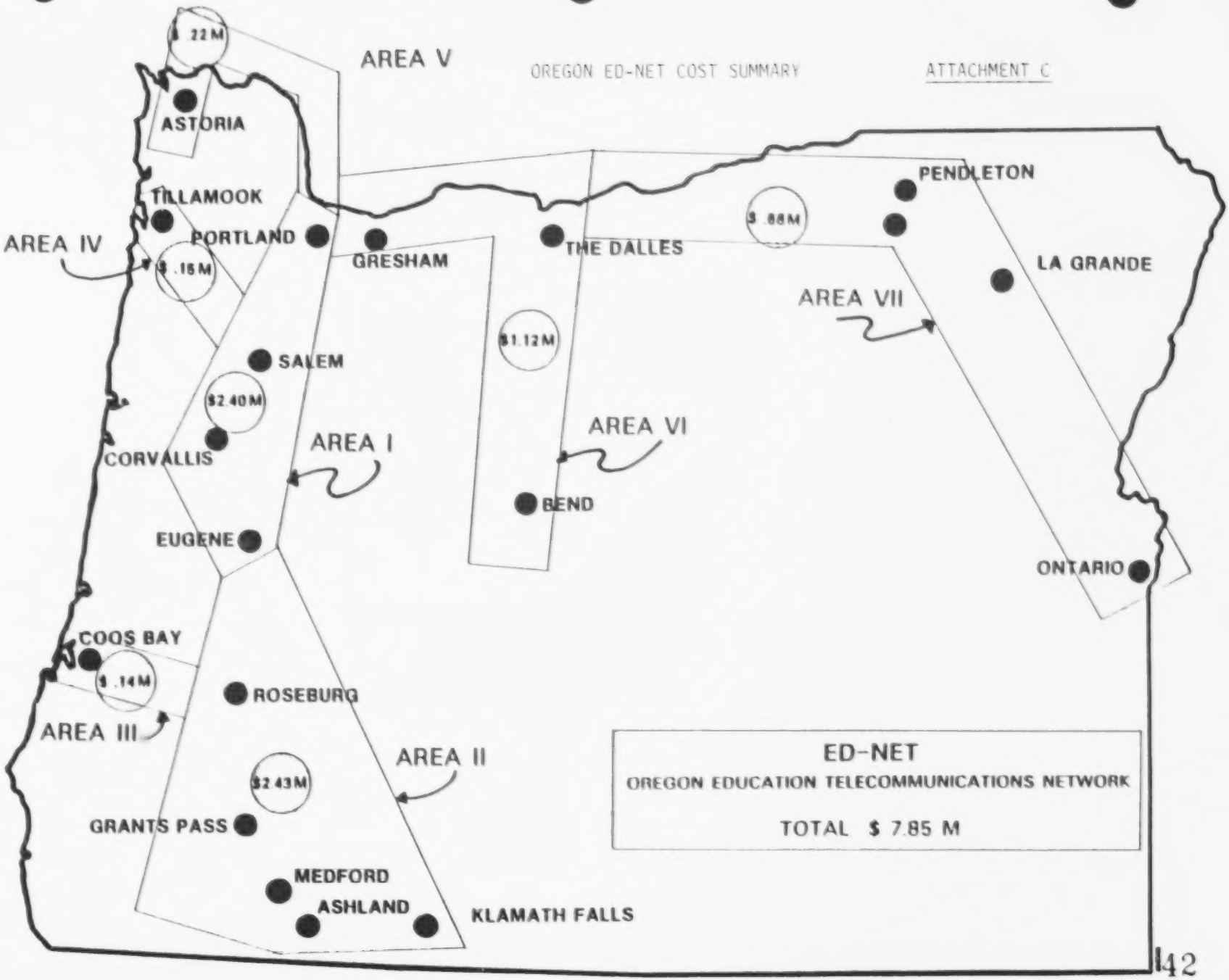
- A $120,000 grant was received from FIPSE in September, 1986, that will be used to develop training programs from industry to upgrade skills among college instructors. The grant will give industry and colleges experience in developing these kinds of reciprocal training programs prior to development of the network. The first program will be held on December 12, 1986, and will be delivered by satellite to any colleges in the United States who want to participate in this program.

- Portland Community College was successful in obtaining a $151,000 grant from the Fred Meyer Charitable Trust to build a two-channel microwave system. It will serve to meet the objectives of the four community colleges in and surrounding metropolitan Portland for delivery of educational services. It will also become part of ED-NET when it is in place.

At this time no opposition exist for development of the network and none is anticipated. The legislative process that begins in January 1987 will determine the final fate of the network. We believe that the foundation has been laid and that, through a public-private partnership that targets economic development, funding should be provided.


OREGON ED-NET MICROWAVE
ATTACHMENT A
NACELLE (Wn. D N R)
KALAMA (WSP)
ASTORIA
ROOSEVELT
STACKER
SKAMANIA
HEALY
TILLAMOOK
Greater PORTLAND Area
GRESHAM
THE DALLES
PENDLETON
LA GRANDE
MT FANNY
BLACK MTN
SHANIKO (P N W Trans)
PROSPECT (Control Ctr)
SALEM
BAKER
VINYARD HILL
CORVALLIS
GRIZZLY
LIME
BUCK MTN
AWBRY BUTTE
BEND
EUGENE
ONTARIO HILL
ONTARIO
COOS BAY
KENYON
ROSEBURG
SCOTT MTN
STARVEOUT
MEDFORD
GRANTS PASS
ASHLAND
KLAMATH FALLS
HAMAKER
SODA
OREGON EDNET-MICROWAVE
BACKBONE ROUTE & LOCATED ITFS SITE
BACKBONE-MICROWAVE ONLY
2-2 WAY CHANNELS
1-2 WAY CHANNEL
1-ONE WAY CHANNEL
ITFS REPEATER
CAMPUS LOCATION
MULTIPLE CAMPUS LOCATION


Microwave
OREGON PUBLIC BROADCASTING
ATTACHMENT B
IN OPERATION
IN PROGRESS
MILES 5 0 10 20 30 40 50
KILOMETERS 10 0 10 30 50
OREGON PUBLIC BROADCAST CURRENT MICROWAVE SYSTEM
Clatsop
Columbia
RADIO SATELLITE
TV SATELLITE
KOAP SYLVAN HTS.
SKAMANIA
STACKER BUTTE
ROOSEVELT
Umatilla
Wallowa
Morrow
Gilliam
Sherman
Tillamook
PORTLAND HEALY HTS
Union
KTVR LA GRANDE MT. FANNY
Yamhill
RADIO SATELLITE
Polk
SALEM PROSPECT HILL
SHANIKO
Wheeler
BLACK MTN.
Grant
Baker
BAKER
Jefferson
KOAC CORVALLIS VINYARD HILL
Linn
KIMBERLY
Malheur
LIME
Lincoln
Benton
Deschutes
GRIZZLY MTN.
JOHN DAY FALL MTN.
Lane
EUGENE
U OF O TV STUDIO
BUCK MTN.
ONTARIO
Douglas
Harney
KOAB-TV BEND AWBREY BUTTE
DEVINE RIDGE
Coos
KENYON MTN.
Klamath
Lake
GLASS BUTTE
BURNS BUTTE
COOS BAY
MT. SCOTT
STONECYPHER BUTTE
PORT ORFORD
Josephine
Jackson
COX MTN.
K. FALLS
FOX MTN. LAKEVIEW
OCTOBER 198
(ED-NET WILL BE OPB TOWERS.)


OREGON ED-NET COST SUMMARY
ATTACHMENT C
AREA V
$ .22M
ASTORIA
TILLAMOOK
AREA IV
$ .15M
PORTLAND
GRESHAM
THE DALLES
$ .88M
PENDLETON
LA GRANDE
AREA VII
$1.12M
SALEM
$2.40M
CORVALLIS
AREA I
AREA VI
BEND
EUGENE
ONTARIO
COOS BAY
$ .14M
ROSEBURG
AREA III
AREA II
$2.43M
GRANTS PASS
MEDFORD
ASHLAND
KLAMATH FALLS
ED-NET
OREGON EDUCATION TELECOMMUNICATIONS NETWORK
TOTAL $ 7.85 M

ATTACHMENT D

GLOSSERY OF TERMS

MICROWAVE. That portion of the electromatic spectrum from 1000 Megahertz to 100,000 Megahertz. These are not exact numerical limits but general borders. This short-wave length radio energy is capable of being focused in a particular direction in contrast to lower frequency radio energy, which is not. It is also capable of being radiated in an omnidirectional or shaped pattern.

BACK-BONE MICROWAVE SYSTEM. A series of directional microwave hops carrying common information, to be dropped off or inserted, between remote points. Equipment on the backbone is generally of higher quality than the gear used to get off or on the backbone route. Antennas are always directional.

ITFS INSTRUCTIONAL TELEVISION FIXED SERVICE. A service, allocated by the Federal Communications Commission (FCC), to provide instructional television between instructor and student. It may also be used for other services associated with education. Frequencies are reserved for this use in a portion of the lower microwave spectrum. Picture and audio transmission uses the same technical standards as normal home television in the U.S.

ITFS ANTENNA SYSTEM. The antenna system associated with an ITFS transmitter (or receiver). It may be omnidirectional, shaped in coverage over rather broad areas, or very directional. ITFS receive antennas are almost always directional.

TALK-BACK CIRCUIT. An audio return link from the ITFS receive location to the originating video/audio point. The equipment used can be either a leased telephone line, dedicated or temporary radio link, or special microwave equipment made for this service.

CONTROL AND SWITCHING SYSTEM. A system of switches controlled by logic circuits to steer the video and audio information up and down the microwave circuits to the proper destinations; much in the same manner that a rail switchyard will put the trains on the proper tracks for their routes.

FAULT WARNING SYSTEM. Sometimes called an "Alarm and Order Wire." Generally a communications voice and data facility that operates behind the scenes to monitor and report status of a microwave system. Preferably, circuits for its operation take a different route from the system being monitored.

CASE

Advancing Two-year Institutions
December 9-11, 1986
Ramada Hotel Old Town
Alexandria, Virginia

Biographical Information on Speaker

Barbara Edge
Development Specialist
Portland Community College
12000 S.W. 49th Ave.
Portland, Oregon 97219
[503] 244-6111 ext. 4285

"Profitable Partnerships: Public-Private Partners in Economic Development"
(educational fund raising and program development)

Directed to intermediate and advanced professionals

Presently, Barbara Edge is coordinator of all activities related to competitive grant proposals for Portland Community College. She has been at Portland Community College for four years and is an 18-year veteran in the education profession.

Ms. Edge is also an author of articles which demonstrate the Community College's role in economic development, primarily for a business readership.

Her additional professional experience includes thirteen years in curriculum development for the Palo Alto Unified School District in California and the Oregon Department of Education.

Ms. Edge received her B.A. in French from SUNY at Albany and her M.A. in education, Stanford University.

CASE

Advancing Two-year Institutions
December 9-11, 1986
Ramada Hotel Old Town
Alexandria, Virginia

Biographical Information on Speaker

William MacDonald
Associate Dean of Instruction
Portland Community College
12000 S.W. 49th Avenue
Portland, Oregon 97219
[503] 240-5307

"Profitable Partnerships: Public-Private Partners in Economic Development"
(educational fund raising and program development)

Directed to intermediate and advanced professionals

William MacDonald has been with Portland Community College for the past 20 years. He has spent the last 22 years in the education profession.

Mr. MacDonald holds a B.A. in commerce, accounting and economics and an M.S. in education.

Presently he is serving as the Associate Dean of Instruction at the Cascade campus of Portland Community College. His main responsibility involves overseeing the curriculum development of all programs and courses on the campus. Cascade is one of the three comprehensive campuses under PCC's jurisdiction.

During the past year and a half,he has managed PCC's Small Business Development Center and worked with the director of the Cascade Business Center Corporation.

After February 1, 1987, Mr. MacDonald is scheduled to assume the duties of Executive Director for Economic Development, a newly created position for Portland Community College.

ERIC Clearinghouse for Junior Colleges
MAR 20 1987